

WELCOME TO DOE'S *RCRA ORIENTATION FOR FACILITY MANAGERS* COURSEWARE

Background This module comprises one component of courseware materials that were developed by DOE's Office of Environmental Policy and Assistance, RCRA/CERCLA Division, EH-413, in response to a request from the Deputy Assistant Secretary for Nuclear and Facility Safety (EH-3). The original course was titled *RCRA Orientation for Nuclear and Facility Safety* and was presented on March 5, 1997, at Germantown, MD. Presentation materials were derived from the more formal three-day course titled DOE's *RCRA Orientation Workshop*, which was developed by EH-413 under a joint funding venture that included the Savannah River Site and the Albuquerque Operations Office.

Courseware Content Although derived from the three-day workshop, DOE's *RCRA Orientation for Nuclear and Facility Safety* (now titled *RCRA Orientation for Facility Managers*) was expanded by developing two new modules to meet the needs of Nuclear Safety Managers. One of the new modules (*Corrective Action*) compares and contrasts RCRA closure and corrective action with CERCLA remedial action by using Oak Ridge Reservation as an example of a radioactively contaminated site closed under RCRA, but undergoing remediation under CERCLA. The other module (*Emerging Issues*) offered a snapshot of the emerging regulations that were expected to impact the Department most dramatically. The remaining courseware modules include:

- Introduction to RCRA and Liability Overview,
- Overview of Solid Waste Determination,
- Overview of Hazardous Waste Determination, and
- Permitting.

PDF "Handout" files only, which contain the aforementioned modules, are designed to serve as stand-alone resources and are equipped with: (1) A list of module contents, (2) Module-specific enabling objectives; (3) Self-assessment questions and answers; (4) A module-specific regulatory citation/key word index; and (5) A module-specific cross-link table that identifies hypertext links to additional Internet resources for hazardous waste-related information.

Using the Courseware Materials Within the PDF Handout modules, users are encouraged to examine the module's Regulatory-Statutory Citation/Key Word Index to identify the availability and location of topics of interest. In contrast, users can simply "dig-in" and sequentially examine the courseware's content. For less extensive reviews or to download additional course presentation materials as needed, users can return to the [RCRA Orientation for Facility Managers Home Page](#) to access electronic files containing the remaining PDF Handout and/or Vugraph files.

To assist users in accessing additional Internet resources, where possible, module-specific hypertext links have been inserted into select points within each of the six PDF Handout courseware modules. Hypertext links appear in both the slide and notes portions as either *blue italicized text* (the first time a link to a particular resource is offered in a given module) or *green italicized text* (each subsequent link to that same resource) and have been assigned to terms and phases for which additional Internet resources such as other EH-413 guidance documents, other Internet Websites, etc. are available. Upon identifying a highlighted term or phase of interest, users generally can access the additional Internet resources by clicking on the highlighted text, which will then hypertext link to another Internet resource. Additional information for obtaining those resources that are not Internet-accessible as well as the objectives, content and organization, use, list of acronyms, Internet resources, and master index is presented in the [*Front-End Materials section*](#) (first section).

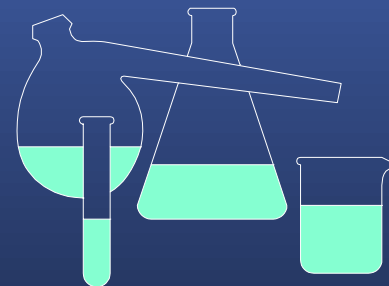
**Feedback
And
Contacts**

If you have difficulty in downloading or reviewing modules comprising DOE's *RCRA Orientation for Facility Managers*, [contact our Webmaster](#) and please [provide us with feedback](#). If you are interested in attending the three-day *RCRA Orientation Workshop*, please contact the [National Environmental Training Office](#). Additional questions concerning this courseware or the information presented therein may be directed to Atam Sikri of my staff by:

- Calling at (202) 586-1879,
- Faxing messages to (202) 586-0955, or
- Communicating electronically, via Internet, to atam.sikri@eh.doe.gov.



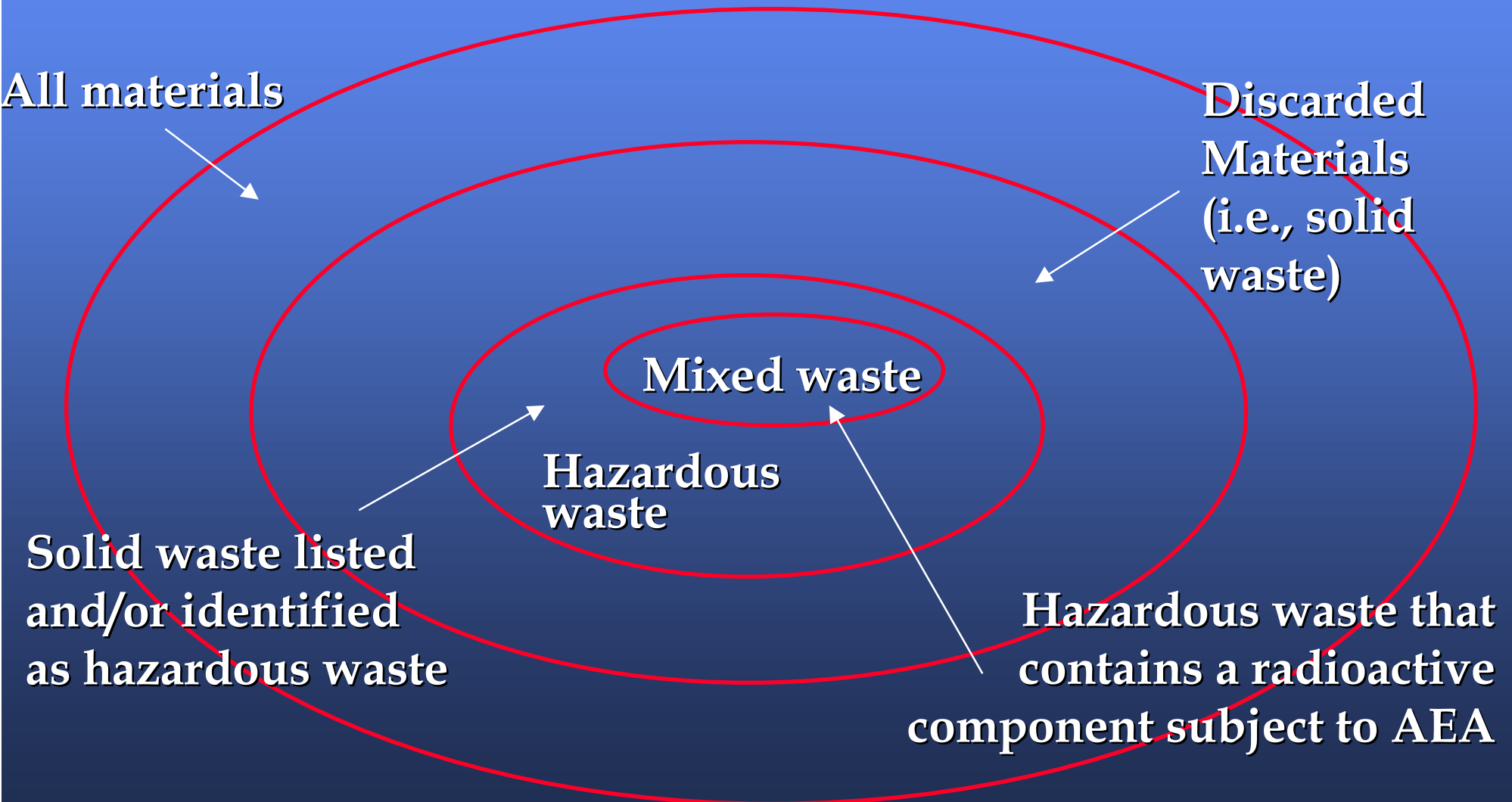
Definition of Hazardous Waste



Hazardous?

- *Hazardous Material*
 - Regulated by DOT
 - Regulated by OSHA
- *Hazardous Constituents*
 - Listed in Appendix VIII 40 CFR 261
 - Not hazardous wastes but may be basis for listing a waste as hazardous
- *Hazardous Waste*
- *Hazardous Substance*

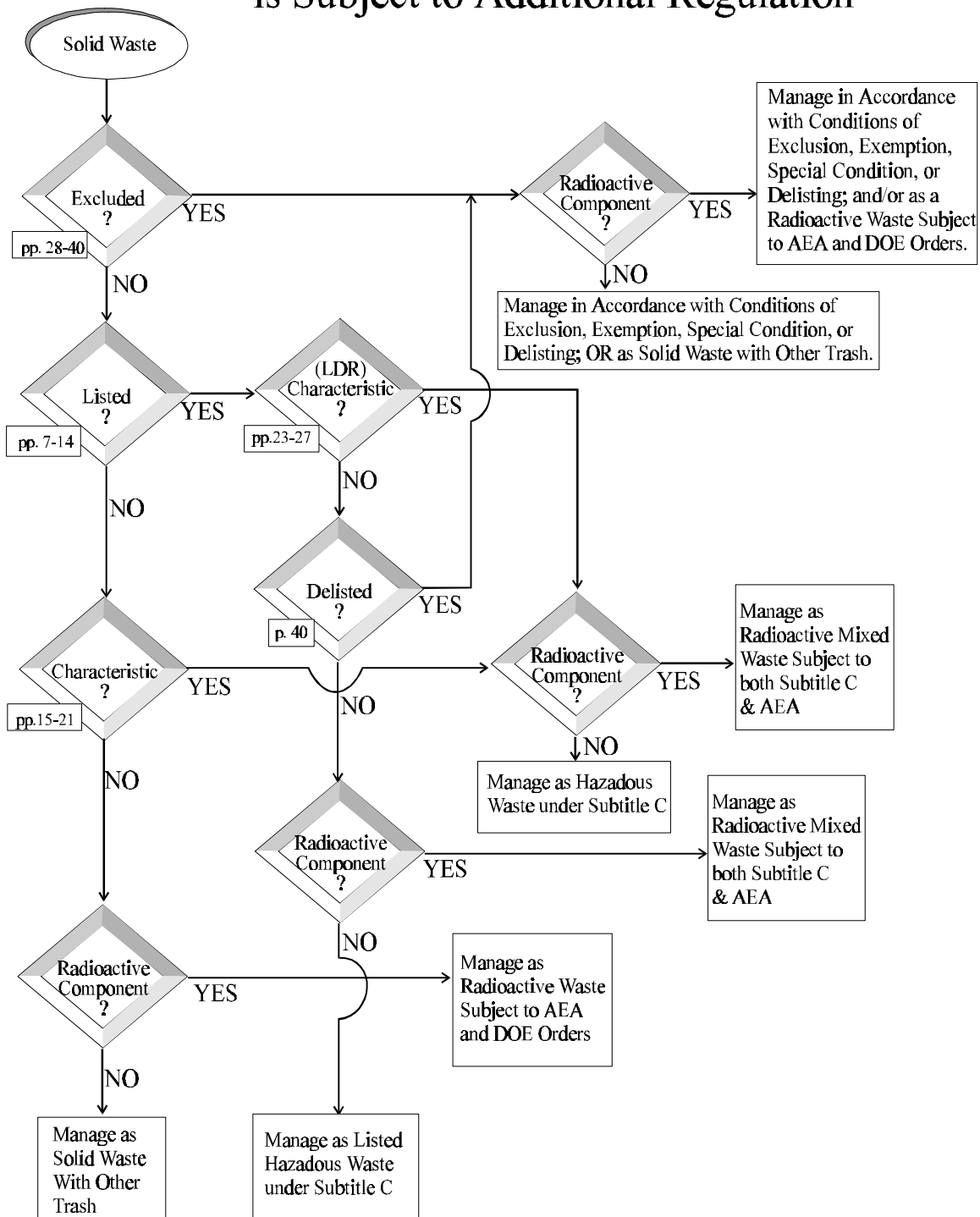
Let' Pick Up Where We Left Off. The Definition of Hazardous Waste Begins With The Solid Waste Definition



Overview of the Definition of Hazardous Waste

- Is the waste excluded?
- Is the waste listed?
 - Is it a mixture of solid waste and listed hazardous waste?
 - Is it derived from the treatment, storage, or disposal of a listed hazardous waste?
 - Does it contain a listed hazardous waste?
- Is the waste a characteristic hazard?

Figure 1. Steps to Determine if Solid Waste is Subject to Additional Regulation



Examining the Second and Third Questions -- Listings and Identification

Subpart D - Lists of Hazardous Wastes

- Wastes from non-specific sources
- Wastes from specific sources
- Discarded commercial chemical products

Subpart C - Characteristics of Hazardous Wastes

- Ignitability
- Corrosivity
- Reactivity
- Toxicity

Listed Hazardous Wastes

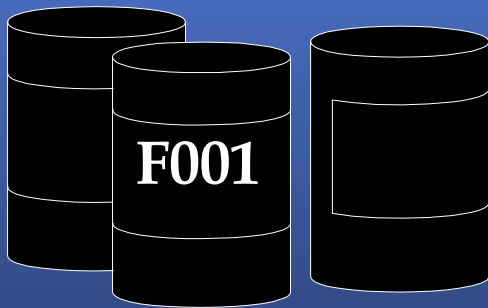
- Subpart D - Lists of Hazardous Wastes
 - Wastes From Non-specific Sources
 - Wastes From Specific Sources
 - Discarded Commercial Chemicals

(F-Listed)

Waste from Non-specific Sources
(*40 CFR 261.31*)

EPA Code

Waste



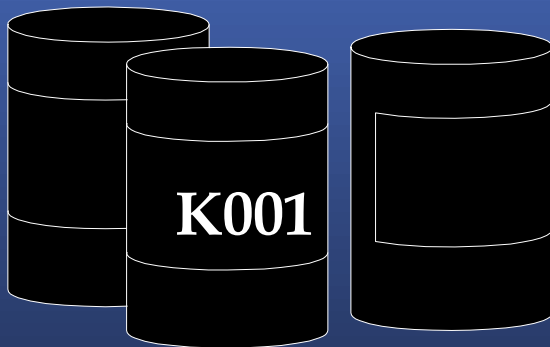
Spent halogenated solvents from degreasing: tetra- and trichloroethylene, methylene chloride, trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons

(K-Listed)
Waste from Specific Sources
(*40 CFR 261.32*)

EPA Code

Waste

Bottom sediment sludge
from treatment of
wastewaters from wood
preserving that uses
creosote and/or
pentachlorophenol



(P- and U-listed)
Listed Discarded Commercial Chemicals
(40 CFR 261.33)

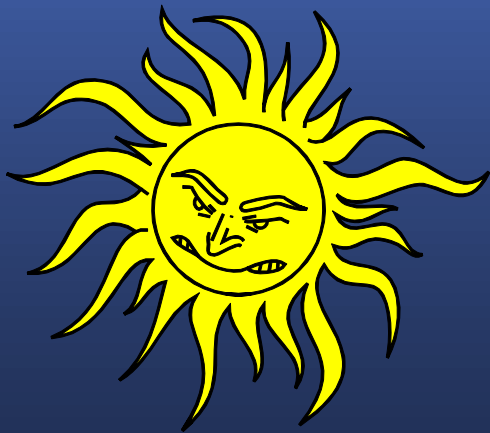
- Off-specification forms of these products
- Mixtures of these products and other materials that are applied to the land
- Mixtures of oil and these products when used as a fuel
- Containers holding these products, unless they are empty
- Spill residues of these products

Types of Discarded Commercial Chemicals:



- *"P" List*

- Acute hazardous waste
- Examples are beryllium, methyl isocyanate, and soluble cyanide salts

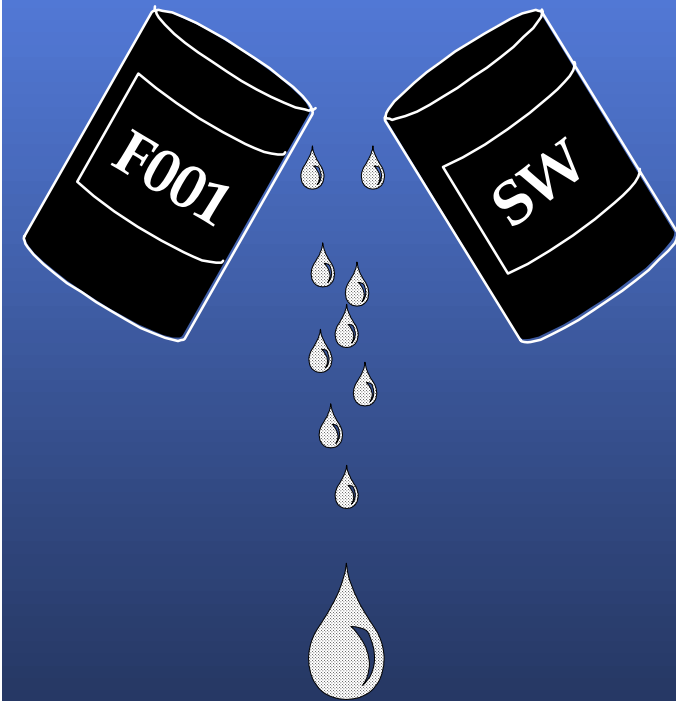


- *"U" List*

- Toxic waste
- Examples are benzene, saccharin salts, and trichloroethylene

Mixture Rule Wastes

[40 CFR 261.3(a)]



- Mixtures of solid wastes with listed wastes
- Mixtures of solid wastes with characteristic wastes

“Derived-From” Wastes *[40 CFR 261.3(c)]*

- Definition

Any *solid waste* generated from the treatment, storage, or disposal of a hazardous waste, including any sludge, spill residue, ash, emission control dust, or leachate (but not including precipitation run-off) is a “derived from” waste.

“Contained-In” Principle

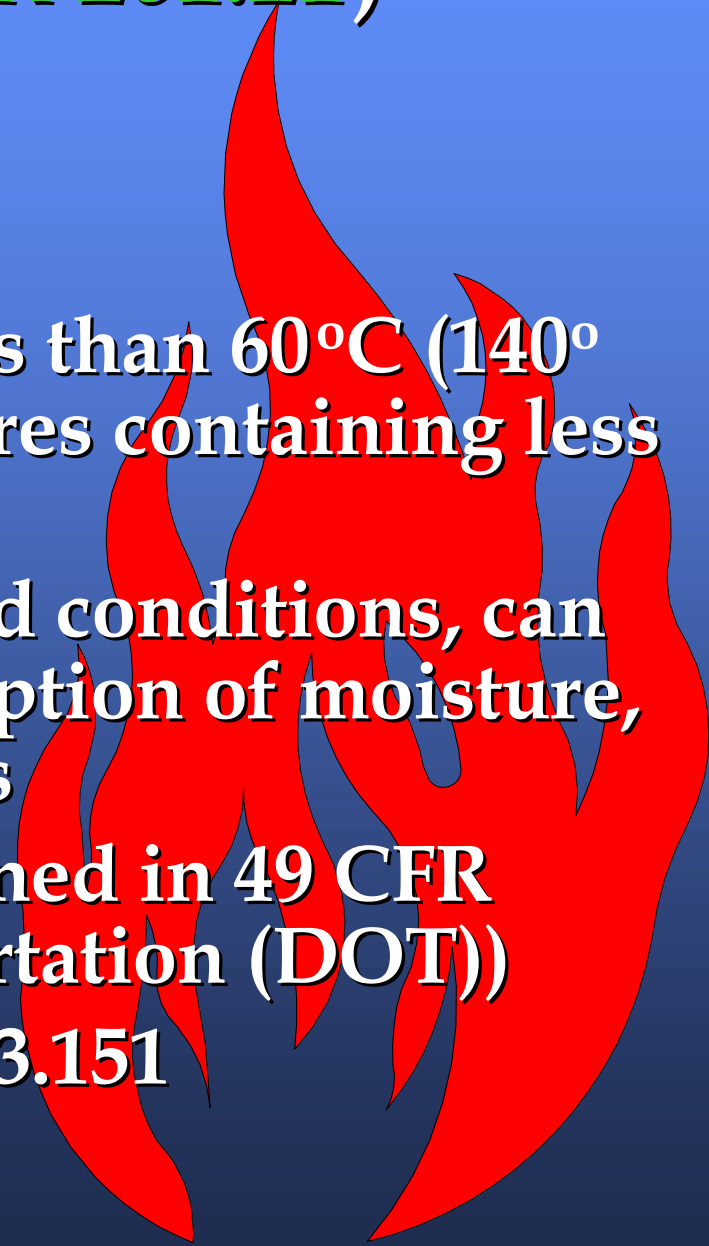
- Originally established to address contaminated media (e.g., soil)
- Exempts debris that the Regional Administrator, considering the extent of contamination, has determined is no longer contaminated with hazardous waste.

Hazardous Waste Characteristics

- Subpart C - Characteristics of Hazardous Waste
 - Ignitability
 - Corrosivity
 - Reactivity
 - Toxicity

Ignitable Hazard (40 CFR 261.21)

- *D001*
- A liquid with a flash point of less than 60°C (140°F), except aqueous alcohol mixtures containing less than 24% alcohol.
- A non-liquid that, under standard conditions, can cause fire through friction, absorption of moisture, or spontaneous chemical changes
- Ignitable compressed gas as defined in 49 CFR 173.300 (Department Of Transportation (DOT))
- Oxidizer as defined in 49 CFR 173.151



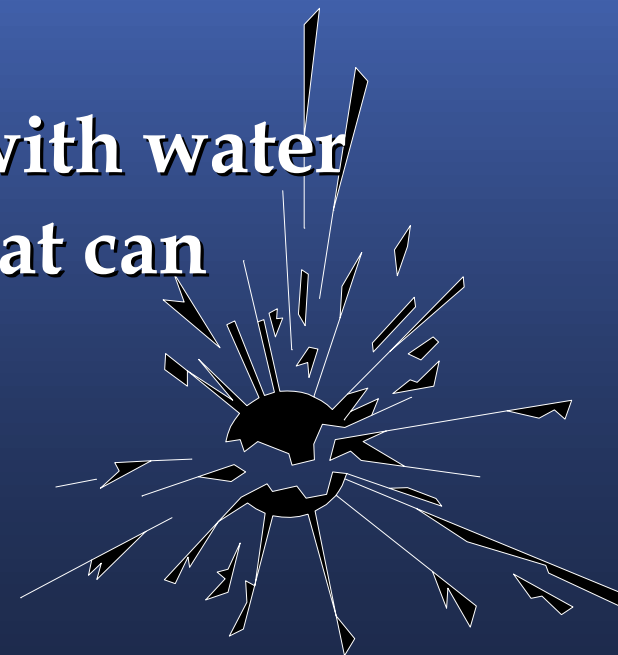
Corrosive Characteristic (40 CFR 261.22)



- *D002*
- Aqueous solution with a pH less than or equal to 2 or greater than or equal to 12.5
- A liquid that corrodes steel at a rate greater than 6.35 mm per year at 55 degrees C (130 degrees F)

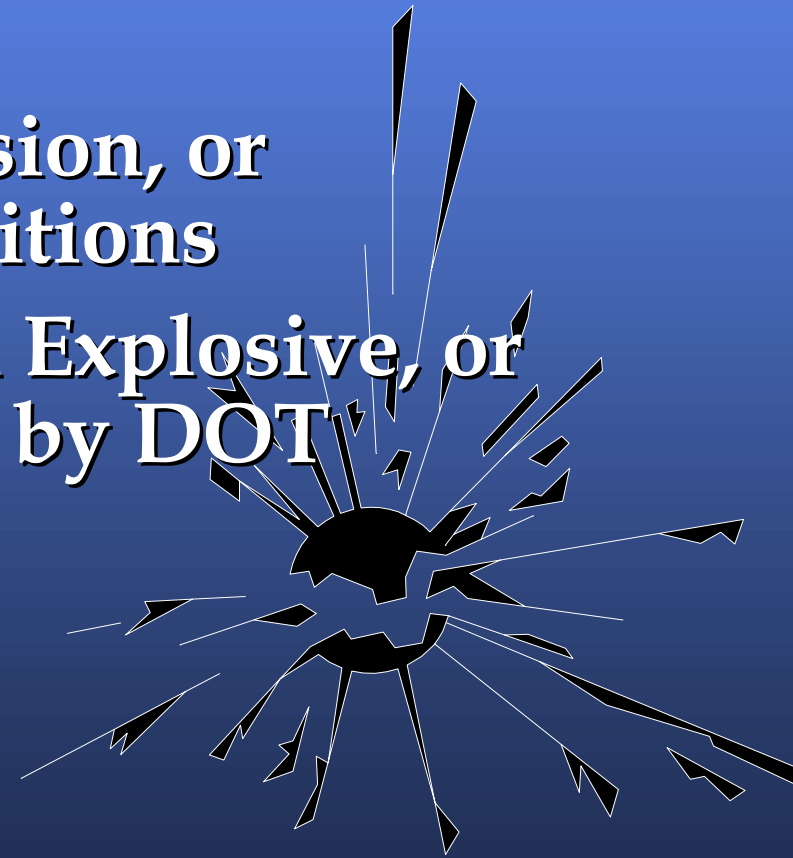
Reactive Characteristic (40 CFR 261.23)

- *D003*
- Normally unstable and readily undergoes violent change
- Reacts violently with water
- Forms potentially explosive mixtures with water
- Generates toxic gases when mixed with water
- Cyanide or sulfide-bearing waste that can produce toxic gases

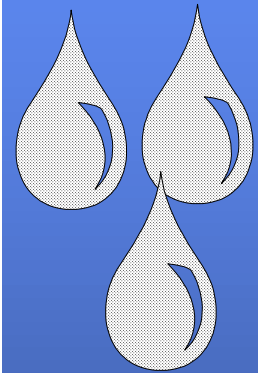


Reactive Characteristic (Continued)

- Capable of detonation if exposed to heat or a strong initiating source
- Capable of detonation, explosion, or reaction under standard conditions
- Forbidden Explosive, Class A Explosive, or Class B Explosive, as defined by DOT



Toxicity Characteristic (40 CFR 261.24)



- *D004 - D043*
- Based on a leachability test (TCLP)
- Waste is deemed hazardous if it equals or exceeds threshold concentrations for specified constituents
- Test method 1311 published in EPA Publication *SW-846*; incorporated by reference [App. II to Part 261]

Toxicity Characteristic (continued)

- 40 constituents identified under toxicity characteristic
 - 8 metals
 - 7 pesticides/herbicides
 - 25 other organic compounds

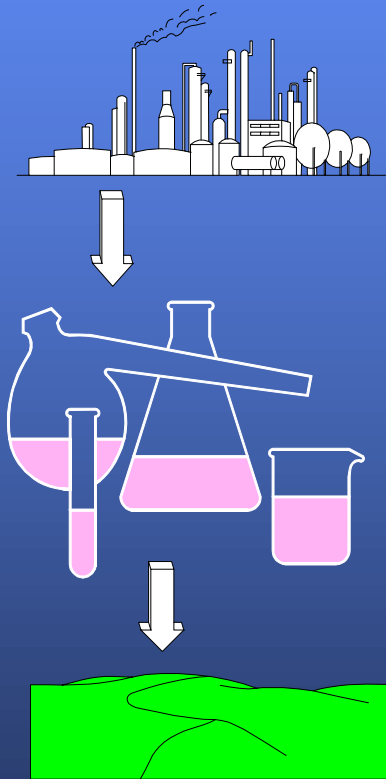
Are we done yet?



Objective of LDR

HSWA established deadlines for EPA to determine the conditions under which land disposal of hazardous waste is protective of human health and the environment. Without a determination, Congress prohibited land disposal.

LDR Summary



- Generate LDR waste
- Treat waste on-site or ship off-site for treatment to meet the applicable treatment standard
- Land dispose the residue

What Standards Must be Met to *Land Dispose*?

- EPA established requirements based on Best Demonstrated Available Technologies (*BDAT*).
- Standards accommodate treatability groups and appear in 40 CFR 268.40, table "Treatment Standards for Hazardous Waste."
- Treatability groups based on waste code (e.g., D009), treatability subcategory (e.g., radioactive lead solids), and form (i.e., wastewater or nonwastewater).

Underlying Hazardous Constituents Must Meet UTS

- **40 CFR 268.48** - Universal Treatment Standards (UTS) must be met for the underlying hazardous constituents in the following wastes:
 - Certain ignitable (D001) and corrosive (D002) characteristic hazardous wastes
 - Organic pesticide toxicity characteristic wastes (D012 - D017)
 - New organic toxicity characteristic wastes (D018-D043)

What Does LDR Mean to *Generators*?

Generators conducting a hazardous waste determination must ALSO:

- Determine whether waste is prohibited
- Identify all applicable listings and characteristic waste codes
- Identify UHCs that are reasonably expected to be present
- Determine and meet the most stringent treatment standard(s) prior to land disposal

Let's Go Back to the *Steps*

- Is the waste *excluded*?
- Is the waste *listed*?
 - Is it a mixture of solid waste and listed hazardous waste?
 - Is it derived from the treatment, storage, or disposal of a listed hazardous waste?
 - Does it contain a listed hazardous waste?
- Is the waste a characteristic hazard?

Exclusions, Exemptions, and Special Conditions

- *Conditionally exempt small quantity generators*
- Materials that are NOT regulated
- Recyclable materials
- Universal wastes
- Residues in “empty” containers
- Delisting

Materials that are NOT Subject to Hazardous Waste Regulations

- Waste remaining in the unit in which it was generated
- Specific wastes
- PCBs
- Sample/Treatability exclusion
- Mixture rule exemptions
- “Derived from” exemptions

Specific Solid Wastes NOT Considered Hazardous Waste [40 CFR 261.4(b)]

- Household waste
- Waste returned to the soil or used as fertilizer
- Mining overburden
- Waste from combustion of fossil fuels
- Wastes from exploration, development, or production of crude oil, natural gas, or geothermal energy
- Waste with trivalent chromium
- Waste from the extraction, beneficiation, and processing of ores and minerals

Specific Solid Wastes NOT Considered Hazardous Waste (Continued)

- *Cement kiln dust*
- Discarded arsenical-treated wood or wood products
- Petroleum-contaminated media/debris subject to UST corrective action
- Reinjecting groundwater
- Used chlorofluorocarbon refrigerant from totally enclosed heat transfer equipment
- *Non-terne plated, hot drained, used oil filters*
- Used oil re-refining distillation bottoms used as a feedstock

Sample/Treatability Exclusion

- The sample/treatability exclusions apply to waste that will be analyzed or treated and include:
 - Solid waste, water, soil, or air collected for testing to determine its characteristics or composition
 - Samples collected for treatability studies
 - Samples undergoing treatability studies

Mixture Rule Exemptions

[40 CFR 261.3(a)(iv)]

- Wastewater discharges regulated under the CWA provided:
 - *Spent solvent* concentrations do not exceed 1 ppm or 25 ppm dependent on the type of listed solvent
 - Heat exchanger bundle cleaning sludge from petroleum refining industry (K050)
 - De minimis losses of *commercial chemical products* or chemical intermediates
 - Wastewaters from laboratory operations containing toxic wastes

“Derived-from” Rule Exemptions *[40 CFR 261.3(c)(ii)]*

- Materials that are reclaimed from solid wastes and used beneficially
- Waste pickle liquor sludge
- Wastes from burning certain recyclable materials that are exempted from regulation
- Certain nonwastewater residues resulting from high temperature metals recovery (HTMR)
- *Hazardous debris* that has been treated using prescribed technology and no longer exhibit a characteristic of a hazardous waste

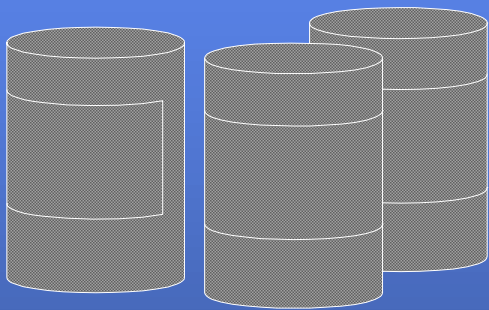
Requirements for *Hazardous Wastes That Are Recycled*

- *Recyclable materials* subject to 40 CFR Part 266
 - Materials used in a manner constituting disposal
 - Hazardous waste burned for energy recovery
 - Used oil burned for energy recovery (OR 40 CFR 279)
 - Materials from which precious metals are reclaimed
 - Spent lead-acid batteries being reclaimed
- *Recyclable materials exempt from regulation*
 - Industrial ethyl alcohol being reclaimed
 - Used batteries returned to a battery manufacturer for regeneration
 - Scrap metal
 - Materials (fuels, reclaimed oil, or hazardous waste fuel) associated with petroleum refining production, or transportation
 - Used oil that is recycled and is also hazardous solely because it exhibits a hazardous characteristic (OR 40 CFR 279)

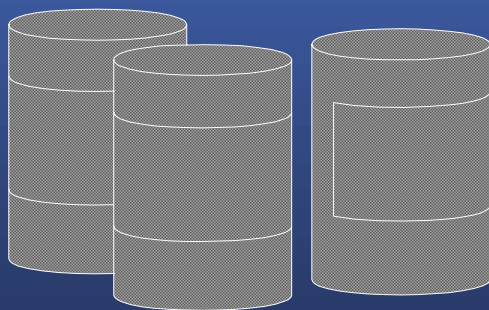
Universal Wastes

- Batteries
- Pesticides
- Mercury-containing thermostats

Are Containers that Held Hazardous Waste Also Hazardous? (40 CFR 261.7)

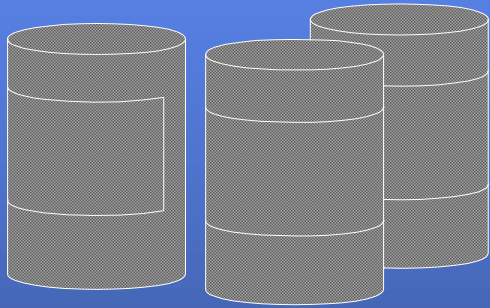


- *Empty containers* are not hazardous

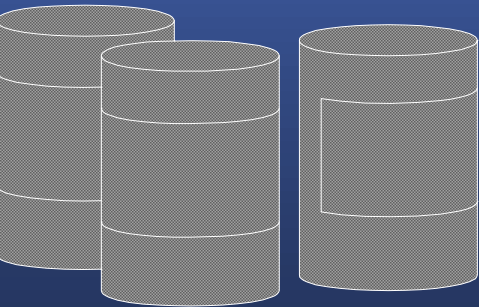


- *Containers are empty* (except those that held acute hazardous waste) if:
 - emptied by conventional methods AND
 - no more than 2.5 cm of residue,
 - 3% by weight if less than or equal to 110 gal in size, or
 - 0.3% weight (total capacity) if greater than 110 gal.

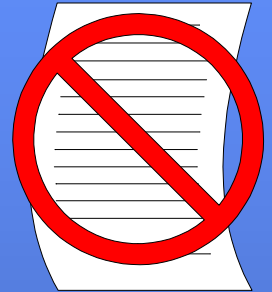
Are Containers Hazardous? (Continued) (40 CFR 261.7)



- *Containers that held acute hazardous waste* are empty if:
 - they have been triple rinsed with an appropriate solvent
 - they have been cleaned by an alternative method demonstrated in the scientific literature
 - the container liner that prevented contact between the product and the container has been removed



Delisting (*40 CFR 260.22*)



- Is a regulatory process
- Requires petitioning the appropriate EPA Regional Office or State
- Requires demonstrating that:
 - the waste produced by a particular facility does not meet the criteria for its waste category
 - no other constituents are present that might require that the waste be regulated as hazardous

Changing Definition of Hazardous Waste

- Additional listings
- Additional criteria
- New or revised exclusions
- Hazardous Waste Identification Rule (HWIR)

Definition of Hazardous Waste in Summary

- The definition of hazardous waste begins with the *solid waste definition*.
- EPA has established a *hierarchy* for performing the hazardous waste determination which includes:
 - Determining if the waste is excluded;
 - Determining whether the waste meets a listing
 - Determining whether the waste exhibits a characteristic
 - To ensure compliance with LDR, determining whether listed wastes also exhibit any characteristics
- Listed waste include the F-, K-, P- and U-listed waste
- There are four characteristics including ignitability, corrosivity, reactivity, and toxicity (D001-D043).
- Mixed waste is the smallest subset of the universe of materials.

Definition of Hazardous Waste Module Cross-Links

Module Page/Line	Cross-Link Language	Resource/Document
HW-2/Slide, Line 1	"Hazardous"	"Hazardous" Terminology; DOE/EH-231-003/0191; http://tis-nt.eh.doe.gov/oepa/cercla/hazterms.pdf
HW-3/Notes, Line 7	"Subtitle I"	Automated Underground Storage Tank Guidance (Macintosh Version); http://tis-nt.eh.doe.gov/oepa/programs/ust.html
HW-3/Notes, Line 12	"Subtitle D"	Solid Waste Landfills Under RCRA Subtitle D, DOE/EH-0512; [not available on OEPA Website]
HW-3/Notes, Line 13	"solid waste"	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-3/Notes, Line 14	"Subtitle C"	OEPA Environmental Law Summary: Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oepa/law_sum/RCRA.HTM
HW-3/Notes, Line 18	"Mixed waste"	EPA Mixed Waste Team Home Page; http://www.epa.gov/radiation/mixed-waste/index.html#general

HW-4/Slide, Line 1	“Overview”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf
HW-4/Notes, Line 1	“solid waste”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-4/Notes, Line 8	“delisted”	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
HW-4/Notes, Line 11	“40 CFR 262.11”	National Archives and Record Administration “Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-4/Notes, Line 11	“generators”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf
HW-4/Notes, Line 15	“excluded”	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
HW-4/Notes, Lines 17-18	“ waste meets a listing”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-4/Notes, Line 19	“Waste exhibits a characteristic”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf
HW-6/Notes, Line 1	“Subpart D of 40 CFR Part 261”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-6/Notes, Line 2	“Subpart C (of 40 CFR Part 261)”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-6/Notes, Line 13	“mixture”	The Mixture Rule Under the Resource Conservation and Recovery Act, DOE/EH-231-005/0991; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/mixture.pdf
HW-6/Notes, Line 13	“derived from”	The “Derived-from” Rule under the Resource Conservation and Recovery Act, DOE/EH-231-035/0693; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/derived.pdf
HW-6/Notes, Line 13	“contained in”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf

HW-7/Slide, Line 1	“Listed Hazardous Wastes”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-7/Notes, Line 2	“F-listed wastes”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-7/Notes, Line 6	“K-listed wastes”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf
HW-7/Notes, Line 12	“P-listed wastes”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-7/Notes, Line 17	“U-listed wastes”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-8/Slide, Line 1	“(F-listed)”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-8/Slide, Line 3	“40 CFR 261.31”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-8/Notes, Line 6	“spent”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-9/Slide, Line 3	“40 CFR 261.32”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-10/Slide, Line 1	“(P- and U-listed)”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-10/Slide, Line 3	“40 CFR 261.33”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html

HW-11/Slide, Line 3	““P” List”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-11/Slide, Line 7	““U” List”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-11/Notes, Line 3	“[40 CFR 261.33(e)]”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-11/Notes, Line 5	“[40 CFR 261.33(f)]”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-12/Slide, Line 1	“Mixture Rule”	The Mixture Rule Under the Resource Conservation and Recovery Act, DOE/EH-231-005/0991; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/mixture.pdf
HW-12/Slide, Line 2	“[40 CFR 261.3(a)]”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-12/Notes, Line 2	“ <u>mixed waste</u> ”	Mixed Waste Focus Area; http://wastenot.inel.gov/mwfa/index.html
HW-12/Notes, Line 10	“Land disposal restrictions (LDR)”	LDR Program Overview, DOE/EH-231/005-0293; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ldr-over.pdf
HW-13/Slide, Line 1	“Derived-From”	The “Derived-from” Rule under the Resource Conservation and Recovery Act, DOE/EH-231-035/0693; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/derived.pdf
HW-13/Slide, Line 2	“[40 CFR 261.3(c)]”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-13/Slide, Line 4	“solid waste”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-13/Notes, Line 1	“ <u>listed</u> ”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf
HW-13/Notes, Line 4	“ <u>characteristic</u> ”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf

HW-14/Notes, Line 1	“contained-in policy”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf
HW-14/Notes, Line 4	“mixture rule”	The Mixture Rule Under the Resource Conservation and Recovery Act, DOE/EH-231-005/0991; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/mixture.pdf
HW-14/Notes, Line 19	“[40 CFR 261.3(f)(2)]”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-15/Slide, Line 1	“Hazardous Waste Characteristics”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf
HW-15/Notes, Line 2	“40 CFR 261 Subpart C”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-16/Slide, Line 1	“Ignitable Hazard”	Ignitable, Corrosive, Reactive, and Incompatible Wastes; DOE/EH-231-054/1294; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ignit.pdf
HW-16/Slide, Line 1	“(40 CFR 261.21)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-16/Slide, Line 2	“D001”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-17/Slide, Line 1	“Corrosive Characteristic”	Ignitable, Corrosive, Reactive, and Incompatible Wastes; DOE/EH-231-054/1294; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ignit.pdf
HW-17/Slide, Line 1	“(40 CFR 261.22)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-17/Slide, Line 2	“D002”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-18/Slide, Line 1	“Reactive Characteristic”	Ignitable, Corrosive, Reactive, and Incompatible Wastes; DOE/EH-231-054/1294; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ignit.pdf
HW-18/Slide, Line 2	“(40 CFR 261.23)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-18/Slide, Line 3	“D003”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html

HW-19/Slide, Line 1	“Reactive Characteristic”	Ignitable, Corrosive, Reactive, and Incompatible Wastes; DOE/EH-231-054/1294; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ignit.pdf
HW-20/Slide, Line 1	“Toxicity Characteristic”	Questions and Answers on the RCRA Toxicity Characteristic; DOE/EH-231-002/0191 [NOT available on OEPA Website]
HW-20/Slide, Line 2	“(40 CFR 261.24)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-20/Slide, Line 3	“D004-D043”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-20/Slide, Line 10	“SW-846”	“DOE Methods for Evaluating Environmental and Waste Management Samples”; http://www.pnl.gov/methods/index.html
HW-21	N/A	N/A
HW-22	N/A	N/A
HW-23/Slide, Line 1	“Objective of LDR”	LDR Program Overview, DOE/EH-231/005-0293; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ldr-over.pdf
HW-23/Notes, Line 2	Hazardous and Solid Waste Amendments (HSWA)	OEPA Environmental Law Summary: Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oepa/law_sum/RCRA.HTM
HW-24/Slide, Line 1	“LDR Summary”	LDR Program Overview, DOE/EH-231/005-0293; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ldr-over.pdf
HW-25/Slide, Line 2	“Land Dispose”	LDR Program Overview, DOE/EH-231/005-0293; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ldr-over.pdf
HW-25/Slide, Line 5	“BDAT”	Complying with LDRs for Contaminated Soil & Debris, DOE/EH-231-002/0191; http://tis-nt.eh.doe.gov/oepa/guidance/cercla/soildbrs.pdf
HW-25/Notes, Line 3	“40 CFR 268.40”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-25/Notes, Line 15	“(40 CFR 268.2)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-25/Notes, Line 16	“Special considerations”	LDR Program Overview, DOE/EH-231/005-0293; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ldr-over.pdf
HW-25/Notes, Line 20	“radioactive lead solids”	Information — Lead and Lead Products Contaminated with Radioactive Material; dated June 27, 1997; http://tis-nt.eh.doe.gov/oepa/guidance/aea/lead.pdf

HW-26/Slide, Line 3	“40 CFR 268.48”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-26/Notes, Line 16	“September 19, 1994 (Phase II) FR”	Federal Register Online via GPO Access; http://www.access.gpo.gov/su_docs/aces/aaces002.html
HW-26/Notes, Line 19	“(60 FR 43654)”	DOE Consolidated Comments - 60 FR 43654, "Land Disposal Restrictions--Phase IV: Issues Associated With Clean Water Act Treatment Equivalency, and Treatment Standards for Wood Preserving Wastes and Toxicity Characteristic Metal Wastes"; http://tis-nt.eh.doe.gov/oepa/comments/rcra/ldr4-cmt.pdf
HW-27/Slide, Line 1	“Generators”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf
HW-27/Notes, Line 3	“storage prohibitions”	Waste Management and the Land Disposal Restriction Storage Prohibition; DOE/EH-231-011/0592; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/storage.pdf
HW-28/Slide, Line 1	“Steps”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-28/Slide, Line 2	“excluded	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
HW-28/Slide, Line 3	“listed”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf
HW-29/Slide, Lines 1	“Exclusions, Exemptions”	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
HW-29/Slide, Lines 3-4	“Conditionally exempt small quantity generators”	Hazardous Waste Generator Requirements; DOE/EH-231-055/1194; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf
HW-29/Notes, Line 9	“(40 CFR 261.5)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html

HW-30/Slide, Lines 1-2	“Materials that are NOT Subject to Hazardous Waste Regulations”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-30/Notes, Line 1	“Wastes still in the unit”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-30/Notes, Line 6	“[40 CFR 261.4(c)]”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-30/Notes, Line 7	“Specific waste”	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
HW-30/Notes, Line 8	“PCBs”	DOE Environmental Guidance - Toxic Substances Control Act; http://tis-nt.eh.doe.gov/oepa/guidance/tsca.htm
HW-30/Notes, Line 15	“Mixture rule exemptions”	The Mixture Rule Under the Resource Conservation and Recovery Act, DOE/EH-231-005/0991; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/mixture.pdf
HW-30/Notes, Line 17	“Derived-from exemptions”	The “Derived-from” Rule under the Resource Conservation and Recovery Act, DOE/EH-231-035/0693; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/derived.pdf
HW-31/Slide, Lines 1-2	“Specific Solid Wastes NOT Considered Hazardous Waste”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-31/Slide, Line 3	“40 CFR 261.4(b)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-31/Notes, Line 8	“PCB-containing dielectric fluid”	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
HW-31/Notes, Line 11	“(40 CFR 261.8)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html

HW-32/Slide, Lines 1-2	“Specific Solid Wastes NOT Considered Hazardous Waste”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-32/Slide, Line 3	“Cement kiln dust”	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
HW-32/Slide, Line 11	Non-terne plated, hot-drained, used oil filters”	Used Oil Final Rule and Correction Notices Issued; Environmental Guidance Regulatory Bulletin dated October 31, 1993 [NOT available on the OEPA Website]
HW-33/Slide, Line 1	“Sample”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
HW-33/Slide, Line 1	“Treatability”	Treatability Study Sample Exemption—Update; EH-413-071/0197; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/treat-ib.pdf
HW-33/Notes, Line 1	“40 CFR 261.4(d)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-33/Slide, Line 20	“40 CFR 261.4(e)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-33/Slide, Line 24	“40 CFR 261.4(f)”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-34/Slide, Line 1	“Mixture Rule Exemptions”	The Mixture Rule Under the Resource Conservation and Recovery Act, DOE/EH-231-005/0991; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/mixture.pdf
HW-34/Slide, Line 2	“[40 CFR 261.3(a)(iv)]”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-34/Slide, Line 5	“Spent solvent”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-34/Slide, Line 9	“commercial chemical products”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings; DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
HW-34/Notes, Line 1	“ <u>listed</u> wastes”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf

HW-35/Slide, Line 1	“Derived-from’ Rule Exemptions”	The “Derived-from” Rule under the Resource Conservation and Recovery Act, DOE/EH-231-035/0693; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/derived.pdf
HW-35/Slide, Line 2	“[40 CFR 261.3(c)(ii)]”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-35/Slide, Line 10	“Hazardous debris”	Hazardous Debris Case-By-Case Capacity Variance; Environmental Guidance Regulatory Bulletin dated July 15, 1992; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/debris.pdf
HW-36/Slide, Lines 1&2	“Hazardous Wastes That Are Recycled”	Requirements for the Recycling of Hazardous Waste; DOE/EH-231-001/0990; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/recycle.pdf
HW-36/Slide, Line 3	“Recyclable materials”	Special Requirements Applicable to Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/special.html
HW-36/Slide, Line 9	“Recyclable materials exempt from regulation”	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
HW-36/Notes, Line 2	“Recyclable materials”	Special Requirements Applicable to Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/special.html
HW-36/Notes, Line 6	“used oil”	Used Oil Final Rule and Correction Notices Issued; Environmental Guidance Regulatory Bulletin dated October 31, 1993 [NOT available on the OEPA Website]
HW-36/Notes, Line 10	“40 CFR Part 279”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-37/Slide, Line 1	“Universal Wastes”	Universal Waste Rule: Final Rule Issued; Environmental Guidance Regulatory Bulletin, August 14, 1995 [NOT available on the OEPA Website]
HW-37/Notes Line 1	“May 11, 1995 Federal Register”	Federal Register Online via GPO Access; http://www.access.gpo.gov/su_docs/aces/aces140.html
HW-37/Notes Line 3	“40 CFR part 273”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html

HW-38/Slide, Line 3	“40 CFR 261.7”	“Code of Federal Regulations - Retrieve CFR by citation”; http://www.access.gpo.gov/nara/cfr/index.html
HW-38/Slide, Line 4	“Empty containers”	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
HW-38/Slide, Line 6	“Containers are empty”	Special Requirements Applicable to Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/special.html
HW-39/Slide, Line 1	“Are Containers Hazardous?”	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
HW-39/Slide, Line 2	“40 CFR 261.7”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-39/Slide, Lines 3-4	“Containers that held acute hazardous waste”	Special Requirements Applicable to Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/special.html
HW-40/Slide, Line 1	“40 CFR 260.22”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-40/Notes, Line 4	“June 25, 1996 Federal Register	Federal Register Online via GPO Access; http://www.access.gpo.gov/su_docs/aces/aces140.html
HW-40/Notes, Line 6	“Appendix IX, 40 CFR 261”	“Code of Federal Regulations - Retrieve CFR by citation” ; http://www.access.gpo.gov/nara/cfr/index.html
HW-41/Notes, Line 7	“HWIR-waste”	DOE Consolidated Comments - Resource Conservation and Recovery Act; “Hazardous Waste Management System: Identification and Listing of Hazardous Waste: Hazardous Waste Identification Rule (HWIR)”; http://tis-nt.eh.doe.gov/oepa/comments/rcra/hwir-com.pdf
HW-41/Notes, Line 8	“HWIR-media”	DOE Consolidated Comments - Resource Conservation and Recovery Act; “Consolidated Departmental Response to Proposed Hazardous Waste Identification Rule for Contaminated Media (HWIR-Media)”; http://tis-nt.eh.doe.gov/oepa/comments/rcra/hwir2.PDF
HW-42/Slide, Lines 3-4	“solid waste definition”	RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/rcrdef.html
HW-42/Slide, Line 5	“hierarchy”	Overview of the Identification of Hazardous Waste Under RCRA; DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf